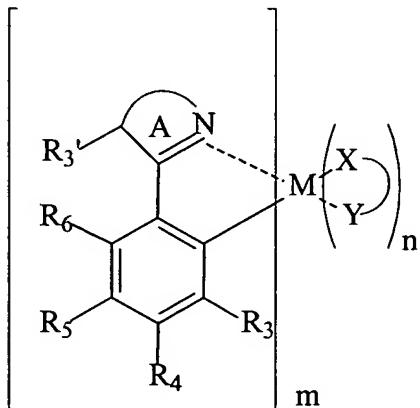


Abstract:

An organic light emitting device is provided. The device has an anode, a cathode, and an emissive layer disposed between the anode and the cathode. The emissive layer further comprises an emissive material having the structure:



wherein M is a metal having an atomic weight greater than 40;

R₃' is a substituent selected from the group consisting of alkyl, heteroalkyl, aryl, heteroaryl, and aralkyl, wherein R₃' is optionally substituted by one or more substituents Z;

R₅ is a substituent selected from the group consisting of aryl and heteroaryl, wherein said aryl or heteroaryl is unsubstituted or optionally, substituted with one or more non-aromatic groups;

ring A is an aromatic heterocyclic or a fused aromatic heterocyclic ring with at least one nitrogen atom that is coordinated to the metal M, wherein the ring A can be optionally substituted with one or more substituents Z;

R₃ is a substituent selected from the group consisting of H, alkyl, alkenyl, alkynyl, alkylaryl, CN, CF₃, C_nF_{2n+1}, trifluorovinyl, CO₂R, C(O)R, NR₂, NO₂, OR, halo, aryl, heteroaryl, substituted aryl, substituted heteroaryl or a heterocyclic group;

R₄ is a substituent selected from the group consisting of H, alkyl, alkenyl, alkynyl, alkylaryl, CN, CF₃, C_nF_{2n+1}, trifluorovinyl, CO₂R, C(O)R, NR₂, NO₂, OR, halo, aryl, heteroaryl, substituted aryl, substituted heteroaryl or a heterocyclic group;

additionally or alternatively, R₃ and R₄, together from independently a fused 4 to 7-member cyclic group, wherein said cyclic group is cycloalkyl, cycloheteroalkyl, aryl, or heteroaryl; and wherein said cyclic group is optionally substituted by one or more substituents Z;

R₆ is a substituent selected from the group consisting of H, alkyl, alkenyl, alkynyl, alkylaryl, CN, CF₃, C_nF_{2n+1}, trifluorovinyl, CO₂R, C(O)R, NR₂, NO₂, OR, halo, aryl, heteroaryl, substituted aryl, substituted heteroaryl or a heterocyclic group;

alternatively, R_{3'} and R₆ may be bridged by a group selected from -CR₂-CR₂-, -CR=CR-, -CR₂-, -O-, -NR-, -O-CR₂-, -NR-CR₂-, and -N=CR-;

each R is independently H, alkyl, alkenyl, alkynyl, heteroalkyl, aryl, heteroaryl, or aralkyl; wherein R is optionally substituted by one or more substituents Z;

each Z is independently a halogen, R', O-R', N(R')₂, SR', C(O)R', C(O)OR', C(O)N(R')₂, CN, NO₂, SO₂, SOR', SO₂R', or SO₃R';

Each R' is independently H, alkyl, perhaloalkyl, alkenyl, alkynyl, heteroalkyl, aryl, or heteroaryl;

(X-Y) is an ancillary ligand;

m is a value from 1 to the maximum number of ligands that may be attached to the metal; and m + n is the maximum number of ligands that may be attached to the metal.

The emissive material itself is also provided. The emissive material may have improved efficiency and stability when incorporated into a light emitting device. Additionally, the devices of the present invention are expected to exhibit improved quantum efficiency.